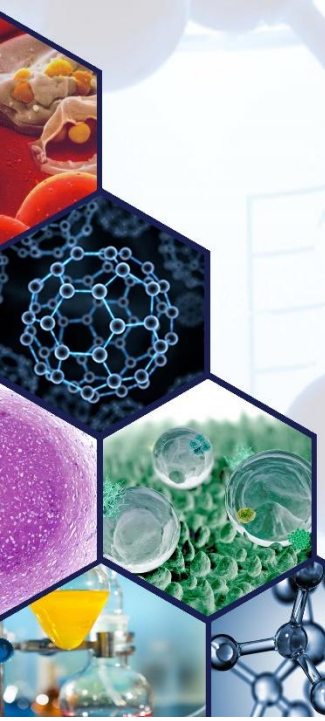
Serbian Young Chemists' Club

Serbian Chemical Society

Seventh Conference
of the Young Chemists of Serbia
Book of Abstracts



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Editors
Tamara TODOROVIĆ
Ljubodrag VUJISIĆ
Jelena RADIVOJEVIĆ
Vuk FILIPOVIĆ

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Vuk FILIPOVIĆ

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SCIENTIFIC COMMITTEE

Dr Tamara TODOROVIĆ
Dr Ljubodrag VUJISIĆ
Dr Jelena RADIVOJEVIĆ

ORGANIZING COMMITTEE

Dr Života SELAKOVIĆ
Vuk FILIPOVIĆ
Jelena LAZIĆ

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Nanoclay reinforcement of poly(urethane-siloxane) copolymers

Ivan S. Stefanović

University of Belgrade - SI Institute of Chemistry, Technology and Metallurgy, National Institute, Belgrade, Serbia

Series of poly(urethane-siloxane) nanocomposites (PUNC) was prepared with the *in situ* polymerization, based on 4,4′-diphenylmethane diisocyanate and 1,4-butanediol as the comonomers of the hard segments (HS) and *α*,*ω*–dihydroxy ethoxy poly(dimethylsiloxane) (EO-PDMS) as the part of the soft segments (SS). PUNC series was composed of five samples of different HS contents (from 10 to 50 wt.%). Organomodified montmorillonite clay (Cloisite 30B®) was used as nanofiller in the amount of 1 wt.% (relative to the total weight of reactants), within prepared PUNCs. The effect of the addition of nanoclay on structure, surface properties and morphology of these PUNCs was investigated.

The obtained FTIR spectra confirm successful preparation and incorporation of nanoclay particles inside of PUNC samples with different compositions i.e HS/SS ratio. Incorporation of the EO-PDMS segments and nanoclay particles i.e. enrichment of the surface of these PUNC films with Si and O atoms allows highly hydrophobic surface of the PUNCs. Samples with the highest content of SS had the best hydrophobicity and the highest contact angle values with water, formamide and diiodomethane. According to the SEM images PUNCs exhibited two-phase morphology that was more pronounced in samples with higher HS content due to the higher level of microphase separation. Moreover, the addition of nanoclay particles has led to the appearance of more prominent cross-sectional morphology [1,2].

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